



# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
Salt Lake District Office  
2370 South 2300 West  
Salt Lake City, Utah 84119



IN REPLY REFER TO:

3800  
(UT-022)

FEB 15 1994

Glenn M. Eurick  
Environmental Affairs Coordinator (USA)  
Barrick Mercur Gold Mine  
P.O. Box 838  
Tooele, Utah 84074

Dear Mr. Eurick:

This letter provides comments on the document titled "Barrick Resources (USA), Inc. Mercur Mine Preliminary Tailings Impoundment Closure Plan."

Thank you for the opportunity to review this preliminary plan. We hope that you find the enclosed comments helpful to you. In this letter, we first present our goals for closure and general comments. We then present comments referenced to page numbers in the document.

## Goals

From our point of view, the closure of the tailings impoundment should achieve a minimum of three goals. First, the closure should be designed so that we have a high level of assurance that the tailings and any contained fluids will be permanently contained and not remobilized. Second, the closure should be designed to ensure that any chemical reactions within the tailings do not generate materials that would be hazardous to the environment if released. Third, the closure should be designed so that a self-sustaining and beneficial plant cover is established on the surface of the containment.

## General Comments

### 1. Applicable BLM Standards

A discussion of BLM-Utah's draft cyanide management policy is presented in section 1.2.4 on pages 4 through 6. Approval of the

preliminary closure plan as written would be at variance with the following specific elements of this draft policy:

1. Tailings impoundments would be left non-impounding and the tailings solids dewatered.
2. Detoxification of tailings would be required on closure.
6. Reshaping of the tailings surface would be required to eliminate collection of precipitation.
7. Tailings impoundments, including dams, would be regraded to a maximum slope of 3h:1v.

and

8. Tailings impoundment liners would be perforated, or the containment dike breached following detoxification.

We are not at this time granting a variance to these conditions because we are not making a decision on the preliminary closure plan with this letter.

The BLM is also guided by national level policy on cyanide issues. A copy of this policy is enclosed. Item 11. c. on page 3 of this policy addresses the construction of tailings impoundments. Item 11. f. on page 4 requires neutralization of tailings ponds upon closure. Your facility was permitted before this policy was implemented. Also, you installed a cyanide kill circuit to your facility after construction. However, we do believe that we must be guided by this policy as we consider the closure of your facility.

In your original permit, filed by Getty and approved in 1986, the closure and reclamation of the tailings pond is covered in one paragraph (Volume 1, Appendix 2, Section 2.3.3, page 2-57). We would like to consider the final tailings pond closure plan as an amendment to your original mining plan under 43 CFR 3809.1-7. Our review and approval of this amendment would allow us to review your plan in detail and grant you whatever specific variances are warranted to our published policies so that we have a satisfactory closure of your tailings pond.

For example, we could decide that leaving the as-built slope on the tailings dam was required to prevent remobilization of the tailings. We could also decide that neutralization of the tailings is not required because the "cyanide" tailings are encapsulated within "clean" tailings and liners. Barrick would benefit from this approach because you would have from us a clearly stated decision that your plan satisfied our regulations.



## 2. Presentation of Information

We believe that the maps could be used to better effect if they showed the location of all information of a geographic nature. Groundwater monitoring wells are not shown, the topsoil stockpile is not shown, the transportation route for reclamation activities is not shown, the line of section for the cross section (Figure 4) is not shown. It could be beneficial to show other items on the map as well. Presently it is difficult to understand the document without a substantial background with the Mercur operation. A more complete map would help a person without this background understand the plan.

## 3. Groundwater Discussion

The understanding of the relationship of the tailings to the ground water is one of the critical components of the closure of this facility. However, we did not note any consideration of transit times in the groundwater system, nor any discussion of the potential for attenuation of constituents of interest in the groundwater system. Granted, it is difficult to characterize a fractured rock system, but if it is likely to take 100 years for contaminated water to reach your monitoring location, your monitoring location needs to be moved. Also, if the constituent to be monitored is subject to rapid attenuation, but other constituents are not, then perhaps we are not collecting the right data. We are not suggesting that there is anything wrong with your plan, we just can't tell if it is properly designed without a discussion of these components of the system.

### Specific Comments

1. Section 1.0, Page 1. BLM permit number is U27-86-08P, not U027. We also cross reference this permit to case U69208.
2. Table 2.2-1, Page 11. Thallium standard is listed as "none." We recommend that this be changed to "no standard" so that it is not confused with a standard of 0.
3. Table 2.2-2, Page 13. Generally, solids are not considered to have a pH. The pH listed is either for a paste extract or for a leachate. Please describe the method used for this determination.
4. Section 2.3.1, Page 13. No mention is made of igneous rocks in this section. Why not?
5. Section 2.3.2, Page 14, Paragraph 5. This paragraph states "silts and clays display much lower hydraulic conductivities." Lower than what? Also, was the zone described removed, altered through compaction, or destroyed when the tailings pond was constructed?

6. Section 2.3.2, Page 14, Paragraph 6. Springs and seeps are described that are now below the level of the tailings. Do these features serve as a source of recharge to the tailings?

7. Section 3.2-2, Page 27. Acid generating and neutralization potentials are listed for three samples taken in 1993. The values generated from these samples are reassuring. However, it is projected that about 22,000,000 cubic yards of tailings will have been deposited in this facility when it is ready for closure. Are these three samples all of the samples that have ever been run at this facility? Do they accurately represent the material behind the tailings dam? It may be necessary to obtain samples of the in-place material so that we can have greater confidence in the accuracy of these values.

8. Section 3.3, Page 29, first paragraph. This paragraph states that one of the pits would be left at closure that would not be free-draining, but would act as a retention structure for any runoff from the tailings pond. This feature would not be on federal land so is not directly concerning to us; however, any water in this pit will either evaporate or infiltrate. Over time evaporation could concentrate contaminants in the runoff to undesirable levels. These contaminants could then be infiltrated and migrate in the groundwater to federal lands. Some sort of treatment of water in this pit may be required. We would appreciate a more detailed discussion of the issues related to this pit.

9. Section 3.6, Page 34. The post-mining land use is listed as wildlife habitat. However, the post-mining land use in the approved plan (Volume 1, Section 2.3.3, page 2-45) is listed as livestock and wildlife. Why has this changed?

10. Section 4.3, Page 35. A capillary barrier of gravel between the tailings and the topsoil should be considered. The pH of the tailings is given as 9.1 which is undesirable for most plants. Capillary rise can bring salts to the surface which would raise surface soil pHs. A capillary barrier could prevent this. The installation of this may not significantly raise your costs if the barrier is also a component of the stone mulch proposed for the control of fugitive dust (see page 31).

11. Section 4.4, Page 36, Paragraph 3. This paragraph discusses intermittent flooding of the reclaimed tailings surface associated with storm events. The reestablished vegetation on this surface could be killed if these ponds do not dissipate rapidly. Is Barrick committed to reseeding if vegetation is killed by these kinds of events?

12. Section 4.5, Page 38, Paragraph 2. This paragraph states that the tailings solids are suitable for use as a growth medium. Based on the data presented, which are insufficient, we disagree.

Table 2.2-2 reports results of two analyses of the tailings solids. These results are averaged, so it is not possible to determine the range of values obtained. This is improper and the table should report each sample individually. Also, two samples are unlikely to be sufficient to adequately represent 22,000,000 cubic yards of material. The samples should not be averaged and more samples from the surface of the tailings should be obtained and analyzed.

Table 2.2-2 reports a boron content of 40 mg/kg (equivalent to ppm). A level of 8 ppm of hot water soluble boron is toxic to plants. The total boron level reported is sufficient to generate the toxic hot water soluble level. The tailings should be analyzed for hot water soluble boron.

Table 2.2-2 reports a copper content of 9.8 mg/kg. A copper to molybdenum ratio of less 2:1 is considered potentially detrimental to ruminants. However, the tailings were not analyzed for molybdenum. A molybdenum content in excess of 4.9 mg/kg would be concerning. The tailings should be analyzed for molybdenum.

Table 2.2-2 reports an arsenic level of 1,190 mg/kg in the tailings. Depending on the form in which the arsenic occurs, this is sufficient to prevent colonization of the material by soil microorganisms that are critical to the long term fertility status of a soil. For materials that are regulated under the Resource Conservation and Recovery Act (RCRA), an arsenic level in excess of 5 mg/l (equivalent to 5 mg/kg) is sufficient to classify the material as a hazardous waste.

The tailings materials are presently exempt from regulation under RCRA because they were generated from the extraction, beneficiation, and processing of ores and minerals. However, the fact that they are legally exempt from regulation as hazardous waste does not make them a suitable plant growth medium. Also, the tailings material exceed RCRA action levels for cadmium (you reported 5.4 mg/kg and the regulatory level is 1 mg/l), and chromium (you reported 14.5 mg/kg and the regulatory level is 5.0 mg/l).

Table 2.2-2 reports a selenium level of 2 mg/kg. Phytotoxic effects have been reported for selenium levels as low as 1 mg/l.

Table 2.2-2 reports a pH for the tailings of 9.1. For a good plant growth material pH should be kept between about 6 and 8. (9.1 indicates that the material will be difficult to manage because of sodicity problems.

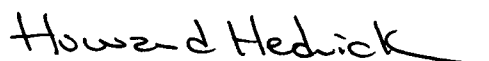
From the comments we have made above you can see why we are of the opinion that the tailings should not be considered a suitable plant growth medium unless further analyses are conducted and these analyses demonstrate that our concerns are without foundation. We understand that the tailings analyses are whole rock analyses and that the elements of concern may be in some state that is not available to plants. However, we must respond conservatively to

you at this time because the process to which you have subjected this material may have liberated substantial quantities of these elements causing them to be mobile in the environment.

13. Table 4.5-2, page 39 and Table 4.5-3, page 40. The scientific names of many of the grasses have recently been changed and the nomenclature has not been finally resolved. However, we are presently using the SCS nomenclature which is different than what you have used in these tables. We have enclosed a list of scientific names that we presently use. Please review your nomenclature in these tables.

Thank you for the opportunity to review this preliminary document. We are happy to discuss any of our comments with you and are available to meet with you and other interested parties to resolve any issues raised here. We are also happy to work with other regulatory bodies to ensure that conflicts between regulatory requirements are resolved. Should you have any questions regarding this letter or wish to meet with us please feel free to call either Phil Allard or Mike Ford at (801) 977-4300.

Sincerely,



Howard Hedrick  
Pony Express Resource Area Manager

Enclosures

Cyanide Policy  
Plant List

cc: D. Wayne Hedberg, UDOGM  
UT-921  
Utah Division of Water Quality